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Vol. 7, No. 3
July 1968

PRICE 20c

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QUARTERLY JOURNAL ON AGRICULTURAL ECONOMICS

Issued by the Department of Agricultural Economics and Marketing, Pretoria

Agricultural exports, economic development, and the balance of payments in South Africa

by

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To be able to assess the role of agricultural exports in the economic development of South Africa, and their contribution to the balance of payments, it is necessary first to consider the significance of exports in general in these respects. After doing so in the first section below, in which reference will also be made to qualifications relating specifically to agricultural exports, the past and present significance of the export sector as a whole in South Africa will be briefly surveyed in the second section. With this general background to draw upon, an attempt will then be made in the third section to assess the significance of South Africa's agricultural exports in the overall picture, and in a final section some conclusions will be framed.

I. The economic literature of the 'sixties is rich in theoretical models purporting to show the relationship between the exports of a country and its domestic economic growth. Thus, in a recent survey Hultman[1] distinguished six categories into which such models can be classified, viz. foreign trade multiplier models, growth models, "leading sector" models, the staple model, export base models, and models of development stages.

These numerous models vary considerably in terms of their rigour of presentation, internal structure and amenability to empirical specification. Rather than entering into an extensive comparative analysis of the various models, use will be made in this paper of one particular approach which, while not very rigorously formulated, "... is none the less of very considerable value in suggesting a number of alternative hypotheses ..." to shed light on specific historical situations.[2] The approach in question is that of Kindleberger, who distinguishes "... three broad models into which real cases may with difficulty be classified: where trade is a leading, a balancing, or a lagging sector of the economy".[3]

EXPORTS AS LEADING SECTOR

In Kindleberger's leading sector model of the role of exports, the export sector is seen as communicating its growth to other sectors of the domestic economy by inducing technological change and investment, or by creating a demand for the production of the other sectors.[4]

Whether export expansion in fact has this effect in any particular case depends on a number of factors. That not all these factors have been present in all economies with large and rapidly expanding export sectors is attested to by the fact that "... despite decades or even centuries of participation in international trade most of the (raw material) export economies have remained at low levels of economic development ..."[5]

Perhaps the most pervasive of the necessary conditions is the existence of "... social and economic systems which could supply the ... factors of production"[6] needed to utilize the opportunities created by export expansion. Where this condition was absent, the fruits of export expansion often accrued to foreign factors of production or to a small and exclusive group of "luxury importers", with the result that minimal amounts of the income generated were spent

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1) C.W. Hultman, "Exports and Economic Growth: A Survey", Land Economics 43(2), May, 1967, pp. 148-57.

2) R.M. Stern, Foreign Trade and Economic Growth in Italy (New York and London: Praeger, 1967), p.56. Stern considers this to be among "... the most noteworthy recent contributions to the subject of export-led growth ..." (p.53), but since he does not find it amenable to exact empirical specification, his empirical estimates are confined to more rigorous models developed by Lamfalussy and Beckerman (p.69).

3) C.P. Kindleberger, Foreign Trade and the National Economy (New Haven and London: Yale University Press, 1962), p.195.

4) Ibid., pp. 196-7.

5) J.V. Levin, The Export Economies: Their Pattern of Development in Historical Perspective (Cambridge, Massachusetts: Harvard University Press, 1960), p.4.

6) Loc. cit.

domestically.[7] In such instances, the export sector can hardly operate spontaneously as a leading sector for development.

In the second place, the development effects of any particular export commodity or bundle of commodities will depend on the nature of the inputs required for its production, on the amount of infra-structure investment its production calls forth, and on the extent to which expansion of its output is dependent on technological change in the export and supporting sectors - in short, on the "... technological nature of the production function" of the export commodity.[8] It stands to reason that, given the necessary socio-economic conditions, growth of an export commodity with strong forward and backward linkages will be more conducive to the spreading of growth through the domestic economy than will be the case if linkages are weak;[9] and the same applies for a commodity whose export requires large investment in transport facilities compared to one requiring little such investment; or one for which technological progress continually raises the production function compared to one chronically subject to the spectre of diminishing returns.

A third condition for exports to operate as a leading sector is, of course, that they must expand at a high rate. In this connection, a thesis developed by Nurkse has gained a good deal of currency in recent years.[10] Briefly stated, this thesis is that while world trade expanded rapidly during the nineteenth century, increasing by some 270 per cent between 1850 and 1880, its growth has slackened drastically during the twentieth, falling to a 170 per cent increase between 1880 and 1913, and further to a mere 57 per cent between 1928 and 1958.[11] Consequently, whereas in the nineteenth century exports provided "... a means whereby a vigorous process of economic growth came to be transmitted from the (growth) center to the outlying areas of the world", developing countries in the twentieth century must seek elsewhere for growth-inducing factors[12]. Of special relevance to the subject of this paper is the following conclusion of Nurkse:[13]

> "... In the years before 1914 exports of primary products were expanding more rapidly than exports of manufactured goods ... In the mid-twentieth century we find, by contrast, a tendency for food and raw material exports to lag behind exports of manufactured goods. More specifically, we observe a lag in the exports of primary producing countries compared with those of industrial countries, ...if we exclude petroleum ..."

It appears then, if Nurkse's thesis is accepted, that the primary producing countries have had to bear the brunt of the twentieth century slackening of world trade. Coupled with various theories and statistical evidence purporting to show that the international commodity terms of trade has tended to shift to the disadvantage of primary products, or more specifically of agricultural products,[14] the Nurkse thesis lends support to the reluctance of many developing countries to place heavy reliance on the expansion of agricultural exports in their development programmes. In such circumstances, exports become a lagging sector[15] and according to the proponents of this hypothesis the most promising sources for rapid growth must then be sought elsewhere, as in the process of import substitution.

AGRICULTURAL EXPORTS IN EXPORT-LED GROWTH

On the basis of all three the above-mentioned sets of necessary conditions for export-led growth, various writers have argued that agri-

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7) Op.cit., Chapter IV. The whole Part I of Levin's book presents a carefully documented analysis of this type of situation. Cf. also D.C. North, "Agriculture in Regional Economic Growth", Journal of Farm Economics 51(4): 943-51, December, 1959; reprinted in C.Eicher and L. Witt, editors, Agriculture in Economic Development (New York and London: McGraw-Hill Book Co., 1964), pp.69-78 (quotations here are from this reprint). On pp.72-3, North contrasts the income distributional effects of plantation and family farm systems, and the resulting expenditure patterns.

8) North, op.cit., pp.72 ff. Kindleberger, op.cit., pp.197-205.

9) That individual industries differ widely in the strength of these linkages is well illustrated by international comparisons of the structure of production, such as quoted in A.O.Hirschman, The Strategy of Economic Development (New Haven: Yale University Press, paperbound edition 1961), pp. 106-7 and the ensuing discussion.

10) R. Nurkse, Patterns of Trade and Development (Stockholm, 1959), especially the first lecture, "Contrasting Trends in Nineteenth and Twentieth Century World Trade". References here are to the reprint in G. Harberler and R.M. Stern, Equilibrium and Growth in the World Economy: Economic Essays by Ragnar Nurkse (Cambridge, Massachusetts: Harvard University Press, 1961), pp.282-336.

11) Ibid., p.190.

12) Ibid., pp. 283-4, 290-304.

13) Ibid., p.291.

14) The usual references on this point are R. Prebisch, The Economic Development of Latin America and Its Principal Problems (Lake Success, New York, 1950): and H.W. Singer, "The Distribution of Gains Between Investing and Borrowing Countries", American Economic Review 40 (Papers and Proceedings): 473-85, May 1950.

15) Kindleberger, op.cit., pp.208-11.

cultural exports are unlikely to stimulate general economic development in the exporting country. Thus, Meier and Myint both ascribe the limited development of many agricultural exporting countries to the plantation system of organization of these export sectors,[16] although Myint does emphasize that this can at most be a reason for reforming the plantation system, and not to turn away from agricultural production as such. Singer, in turn, contends that the spill-over effects of primary export expansion are limited[17], and this observation gains support from Hirschman's conclusion that "agriculture in general, and subsistence agriculture in particular, are ... characterized by the scarcity of linkage effects", and that "... agriculture certainly stands convicted on the count of its lack of direct stimulus to the setting up of new activities through linkage effects ..."[18] And, as already suggested above, the negative theses on the expansion of primary exports and the alleged deterioration of the terms of trade of primary exporting countries often refer specifically to agricultural exports.

The trouble with all these arguments is, of course, that they rest on sweeping generalizations about "primary" or "agricultural" commodities, and can therefore not without closer analysis shed light on the experience of any particular country at any given time. Morgan, for instance, in examining the statistical data underlying the Prebisch terms-of-trade thesis, found that the evidence for different countries over similar periods, or for the same country over different periods, diverged so much that he thought it more useful "... that emphasis ought to be centered on the heterogeneity of price experience ... for different commodities, countries and times ..." rather than searching for generally valid hypotheses.[19]

Similarly, on the socio-economic and technological conditions for export-led growth Kindleberger, North, and Swerling, among others, have emphasized that agricultural products differ in the effect their export growth has on domestic development.[20] The need is hence for intensive studies of the experiences of individual countries.

EXPORTS AS BALANCING SECTOR

Even if it is established that exports are no longer a leading sector, and hence that late developing countries have to look for important sources of growth elsewhere, it does not follow that exports no longer have a crucial rôle in the development process. Indeed, in such circumstances it may be essential for exports to provide close support to the new leading sectors of growth, in effect balancing the foreign exchange losses caused by the latter.[21]

In particular, if domestic industrialization based on import substitution and the growth of domestic demand is to be the leading growth factor, it is likely, especially in the earlier stages of such development, that "... foreign goods (will) enter as inputs into the domestic production function" both in the form of capital goods and of intermediate products.[22] Should exports fail to expand at a satisfactory rate, it could turn out that the inability to import such foreign inputs may prevent the economy from achieving the growth rate warranted by the rate of domestic savings.[23] Whether in fact a given country is able to overcome this foreign exchange bottleneck will depend on its capacity to adapt its output structure to the requirements of foreign markets.[24]

From what appeared above, it is clear that there is a widespread belief that agricultural commodities, or more generally primary commodities, are relatively unpromising avenues for export expansion.[25] Since, however, it was also concluded that generalizations on this matter are vulnerable, and that the evidence for particular countries need to be studied, it is now time to turn to the experience of South Africa in regard to the role of exports in general and agricultural exports in particular in economic development.

II. There is general agreement among students of South Africa's economic history that the mineral

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16) G.M. Meier, "The Problem of Limited Economic Development", Economia Internazionale 6(4), 1953. The reference here is to the reprint in A.N. Agarwala and S.P. Singh, The Economics of Under-development (London and Bombay : Oxford Univ. Press, 1958), p.68.

17) Singer, op. cit.

18) Hirschman, op. cit., pp.109-10.

19) T. Morgan, "The Long-run Terms of Trade between Agriculture and Manufacturing", Economic Development and Cultural Change 8(1): 1-23, October 1959, p.20.

20) Kindleberger, op.cit., pp.198-201 North, loc. cit. B.C. Swerling, "Some Interrelationships between Agricultural Trade and Economic Development", Kyklos 14(3):364-95,1961, pp. 377-9.

21) Kindleberger, op.cit., pp.205-8.

22) R.I. McKinnon, "Foreign Exchange Constraints in Economic Development and Efficient Aid Allocation", Economic Journal 74(2): 388 409, June 1964, p.389.

23) Ibid., pp.389-391.

24) Ibid., pp.403-6. Cf. also J.A. Lombard, "Output-input Frictions and the Balance of Payments", South African Journal of Economics 32(3) 228-31, September 1964 and Hirschman, op. cit., pp.166-73.

25) In addition to the references already made to the writings of Nurkse, Prebisch, and Singer, cf. also McKinnon, op. cit., pp.388, 404, where he appears to concede their general thesis.

discoveries towards the end of the nineteenth century set in motion a vigorous process of export-led growth, conforming closely to Kindleberger's concept. In the words of Frankel: "Gold has played the same part, relatively speaking, in the emergence of South Africa as an economic power, as coal did in Great Britain".[26] However, although Frankel went on to state that "gold mining continues to occupy this pre-eminent, and so far irreplaceable position in the South African economy", more recent evidence indicates that the role of gold, in common with that of the rest of the export sector, has undergone a marked change during the twentieth century.

Steenkamp, quoting T.A. du Plessis, places much emphasis in this regard on the tendency for the share of exports in South Africa's gross domestic product (G.D.P.) to fall, with the share of imports remaining constant, between 1917 and 1957.[27] More recent figures, also compiled by T.A. du Plessis, are more ambiguous, indicating that while the share of exports in the G.D.P. decreased only slightly but fairly consistently from an average of 33.1 per cent for the period 1921-29 to 29.4 per cent for the period 1959-66, the share of imports fluctuated somewhat, but decreased between the same terminal years from 29.6 to 24.8 per cent.[28] Nevertheless, on the basis of an intensive study of the expansion of four causal factors of growth relative to the growth of the G.D.P. in real terms, T.A. du Plessis has concluded that over the forty-year period 1916-17 to 1956-57, "... final domestic demand and import substitution were the two major propelling forces of growth. Increased intermediate demand owing to technological changes ... only slightly contributed to the more than proportionate growth of outputs ....." "So far as the role of exports is concerned it can be noted that during both the twenty-year periods under consideration total exports had a retarding effect on the growth of the economy, as measured from proportionate expansion ..."[29]

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26) S.H. Frankel, The Economic Impact on Underdeveloped Societies: Essays on International Investment and Social Change (Cambridge, Massachusetts: Harvard University Press, 1959), Essay VI, p.113.

27) W.F.J. Steenkamp, Suid-Afrika se Buitelandse Handelspolitiek in die Afgelope Veertig Jaar (Mededelings van die Universiteit van Suid-Afrika, No.C.64, Pretoria, 1966), p.6.

28) T.A. du Plessis, "The South African Economy", Finance and Trade Review 7(5 and 6): 135-56, March/June 1967, p.153.

29) T.A. du Plessis, The Industrial Growth Pattern and the Real Forces of Economic Expansion in South Africa, 1916/17-1956/57 (D.Com. dissertation, University of South Africa, Pretoria, 1965), pp.222-3.

While Du Plessis's method has come in for criticism by Steenkamp on the count that it ignores price tendencies and thus understates the role of especially gold production,[30] the tendencies on which the quoted conclusions rest are so pronounced as to leave little doubt that domestic factors rather than exports have provided the most vigorous growth impulses since World War I. To this extent, South Africa's experience has conformed to the pattern to be expected on the basis of Nurkse's above-mentioned analysis. However, that the rôle of exports, particularly primary exports, in South Africa's economic development during this period is in Kindleberger's terminology better described as a balancing rather than a retarding one, has been well illustrated by J.C. du Plessis.[31]

In answering the questions "... which groups of industries were ... enabled to run deficits on their international transactions, (and) where do the other foreign earnings come from ...", J.C. du Plessis found that the primary sectors of the economy, viz. agriculture, forestry and fishing, and mining, provided on the average 97.9 per cent of the positive net contribution to the current account of South Africa's balance of payments, during the period 1956 to 1964 while manufacturing, the sector which had grown at the highest rate, was responsible on the average for 26.2 per cent of the negative net contribution to the current account over the same period.[32] Thus, without entering into the controversy about the implications of these figures for South Africa's future growth,[33] it can be accepted that while domestic factors, mainly in the form of industrialisation, were the dominant growth factors, the primary export sectors have played a crucial supporting or balancing rôle by providing foreign exchange without which a serious constraint on growth would undoubtedly have become operative. To what extent agricultural exports contributed to this balancing role is the subject of the next section.

III. Of the three sets of conditions mentioned earlier, which determine whether exports can lead economic development, the last, that exports must expand rapidly, lends itself most directly to empirical analysis and will, therefore, be treated here first.

Two components together determine the rate at which the value of agricultural exports expand, viz. the growth of the physical volume and the movements in the price level of agricultural exports.

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30) Steenkamp, op. cit., p.14.

31) J.C. du Plessis, "Investment and the Balance of Payments", South African Journal of Economics 33(4): 311-340, December, 1965.

32) Computed from Statement 2, ibid., p.330.

33) Cf. J.C. du Plessis, op.cit.: and T.A. du Plessis, "The Balance of Payments and the Economic Development Programme", South African Journal of Economics 34(2):124-32, June 1966.

PHYSICAL VOLUME MOVEMENTS

No continuous index of the physical volume of agricultural exports is available for the past forty years, but it is possible to use two separately available indices to get some indication of long-run tendencies, although we are left with a gap for the years 1953 to 1957. First, Grové has compiled indices of the physical volume of South Africa's exports by statistical classes for the period 1925 to 1952.[34] His Class I contains a highly representative selection (93.2 per cent by value in his base period) from the class "Animals, Agricultural and Pastoral Products and Foodstuffs", i.e. Class I of the statistical classes used by the Bureau of Statistics before the introduction of the Standard International Trade and Industrial Classifications. As such, it includes large numbers of processed foodstuffs which were later to be included in the I.S.I.C. under manufacturing industry. Since, however, such foodstuffs have a high agricultural component,[35] the class as a whole can be regarded as reasonably representative of agricultural exports.

The other index which is useful for the purpose at hand is the Bureau of Statistics' index of the physical volume of South Africa's exports by I.S.I.C. sections and divisions, for the years since 1958. The relevant indices appear in Table 1, with the indices for agricultural and related products expressed also as percentages of the indices of total exports, to give a measure of the relative expansion of agricultural exports.

From Table 1 we can conclude in the first place that while South Africa's total physical exports increased fairly steadily between the middle 'twenties and the early 'fifties, especially if gold is included, her physical agricultural exports followed a fluctuating tendency, increasing from an index value of 88.7 for the middle 'twenties to 99.0 for the early 'thirties; then steadily decreasing to 75.6 for the middle 'forties and increasing sharply to 103.0 for the years centering on 1950. The gap in the data does not allow any conclusions for most of the 'fifties, but since 1958 the physical volume of agricultural, forestry and fishing exports increased steadily from an index value of 94 to 145 in 1963, only to fall back to 85 in the drought year 1965. Food exports appear to have followed a similar course. Generally speaking, the tendency seems to have been for the physical volume of agricultural exports to move upwards, although with marked interruptions.

If the indices of the physical volume of agricultural and related exports are expressed as percentages of those for all exports, the resulting percentages, if gold is excluded from total exports, increased from 128 for the middle 'twenties to 146 for the middle 'thirties, after which it declined to 93 for the years around 1950; if gold is included in total exports, the relative decline set in some five years earlier. From 97 for 1958, the corresponding percentage for agriculture, forestry and fishing, with gold excluded from total exports, first declined to 87 for 1960 increased to 114 for 1963, and with the onset of the drought fell back to 86 for 1965. Food exports showed a more fluctuating relative movement, but on the whole seem to have kept pace with total physical exports. The overall pattern that suggests itself is that the physical growth of agricultural and related exports tended to lag behind that for total exports up to around 1950, and to start catching up at the latest during the 'sixties, only to be interrupted by the severe drought of the middle 'sixties.

PRICE MOVEMENTS

As is the case with the physical volume, no single continuous series is available to represent long-run price movements of South Africa's agricultural exports. However, by piecing together various available series, it is again possible to get a fairly good impression for the period since 1925.

In the first place, Grové's[36] indices of the unit value of South Africa's exports, according to the same statistical classes described above in relation to the physical volume indices, are available. Grové's series cover only the period 1925 to 1952. Fortunately, a closely related series is obtainable for the period 1950 to 1958, based on calculations made by Van Waasdijk.[37] He presented separate series for (a) Wool, (b) Hides, Skins and Wattle, and (c) Food and Beverages. Since in his base year, 1950, these three categories together accounted for some 97 per cent of the total value of exports in the Bureau's Statistical Classes I and II, they can be regarded as representative of the same bundle

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34) E.L. Grové, Volume- en Prysindekssyfers van die Buitelandse Handel van die Unie van Suid-Afrika, 1925-1952, volgens die formules van Laspeyres, Paasche en Fisher (D.Com. dissertation, University of Pretoria, 1955).

35) In 1956 the composite I.S.I.C. division of Food, Beverages and Tobacco, of which Food made up by far the largest part, had an agricultural component of some 55 per cent. Cf. T.A. du Plessis, "An Analysis of Certain Structural Aspects of the South African Economy", Finance and Trade Review 5(3): 115-25, September 1962, p.119.

36) Grové, op.cit.

37) T. van Waasdijk, "Changes in South Africa's Terms of Trade, 1950-1958", South African Journal of Economics 27(2): 116-24, June 1959.

TABLE 1 - Relative changes in the physical volume of South Africa's agricultural exports, average for five-year periods 1924 to 1952, and annually 1958 to 1965

Five years with central year	Animals, agricultural and pastoral products, and foodstuffs[2]	Combined exports		I as percentage of II	I as percentage of III	Agriculture, forestry, and fishing[4]	Food[5]	Total merchandise exports (excluding gold)	IV as percentage of VI	V as percentage of VI
		Excluding gold	Including gold							
	I	II	III			IV	V	VI		
	Base period: 1947-49=100[3]			%	%	Base year: 1957=100[6]			%	%
1925[1]	88.7	69.3	54.7	128	162	..	..	..	..	..
1930	99.0	72.6	57.0	136	174	..	..	..	..	..
1935	96.2	66.0	58.4	146	165	..	..	..	..	..
1940	89.2	74.8	60.2	119	148	..	..	..	..	..
1945	75.6	82.6	67.4	92	112	..	..	..	..	..
1950[7]	103.0	110.8	95.5	93	108	..	..	..	..	..
Year										
1958	..	..	..	..	..	94	123	97	97	127
1959	..	..	..	..	..	99	120	108	92	111
1960	..	..	..	..	..	98	135	113	87	119
1961	..	..	..	..	..	117	157	119	98	132
1962	..	..	..	..	..	139	157	123	113	128
1963	..	..	..	..	..	145	177	126	114	122
1964	..	..	..	..	..	129	188	127	98	148
1965	..	..	..	..	..	85	..	99	86	..

Sources: Columns I to III from E.L. Grové, Volume- en Prysindekssyfers van die Buitelandse Handel van die Unie van Suid-Afrika, 1925-1952, volgens die formules van Laspeyres, Paasche en Fisher (D.Com. dissertation, University of Pretoria, 1955), Tables 11 and 38, pp. 47, 88. Columns IV to VI from Bureau of Statistics, Statistical Year Book 1964, p.0-21 and ibid. 1966, p.Q; and Bureau of Statistics, Bulletin of Statistics 1(2), September 1967, Tables G-5 and G-6.

1) The four years 1924 to 1927 only
2) Grové's Class I
3) Fisher formula
4) I.S.I.C. Section O
5) I.S.I.C. Division 20
6) Laspeyres formula
7) The four years 1948 to 1951 only

of goods as Grové's Class 1.[38] Accordingly, the three categories were combined by applying the appropriate base year weights, obtained from the Annual Statement of Trade and Shipping, to the three separate series.

We now have Grové's index of unit value of "agricultural" exports, stretching from 1925 to 1952 with base period 1947 to 1949, and calculated according to Fisher's Ideal Formula[39]. In addition, we have his corresponding series of the index of unit values of South Africa's combined exports and imports, and her commodity terms of trade with the outside world. By dividing the index of unit values of combined imports by that of agricultural exports, we get the partial terms of trade relating to agricultural exports, henceforth to be referred to as South Africa's "agricultural terms of trade" with the outside world.

38) The Bureau's Statistical Class II (Ales, spirits, wines and beverages) is thus included in Van Waasdijk's series, while it was excluded from Grové's as used here. However, since Class II accounted for only 2.3 per cent of the combined value of Classes I and II in 1950, Van Waasdijk's base year, its inclusion in the one and exclusion from the other series is unlikely to make a great deal of difference.

39) Grové also made calculations using the Laspeyres and Paasche formulae, but since he himself gave preference to the Fisher formula, and used only the Fisher formula in his final terms of trade calculations, this particular version of his calculations are used here.

Dividing the agricultural terms of trade by the terms of trade for all products combined, we get what will be referred to as the "relative agricultural terms of trade".

Similarly, we have the corresponding series of Van Waasdijk for the period 1950 to 1958 with base year 1950 and calculated according to Laspeyres' formula. On the basis of these data, the agricultural terms of trade and the relative agricultural terms of trade can also be calculated for this period.

It remains then, in order to achieve some continuity, to link the Van Waasdijk series with Grové's series. This was simply done by equating the Van Waasdijk base year values of the agricultural and relative agricultural terms of trade to the corresponding 1950 values of Grové's series and recalculating the Van Waasdijk values for subsequent years in the same ratio. Despite the theoretical reservation which may be raised against such a procedure, it is felt that in view of the similar commodity composition of the two series, and the proximity of their base periods, not too much violence is done to the usefulness of the data in this particular instance. The results of these manipulations appear in Table 2.

For the remaining years the most suitable available series for the purpose at hand is the unit value index calculated since 1958 by the Bureau of Statistics on the basis of I.S.I.C. sections and divisions according to Paasche's formula. The most applicable categories here are once again Section O (Agriculture, Forestry and Fishing) and Division 20 (Food), while Divisions 21 (Beverages) and 22(Tobacco) are ignored on account of their relative insignificance. Due to the changing weights of the Paasche formula, it was not possible to combine Section O and Division 20 in any simple way, and accordingly the partial and relative terms of trade were each calculated separately for the two categories. Consequently, and also because of the rather different composition of these two categories, no attempt was made to link these series to the Grové-Van Waasdijk series; instead, their original base year, 1957, was maintained in Table 2.

Since South Africa's imports are dominated by non-food manufactured goods[40], the movements of the agricultural terms of trade shown in Table 2 provide a test for the Singer-Prebisch terms-of-trade thesis in the South African context.[41] The conclusion must be that the thesis is not validated by South Africa's experience.

During the thirty-year period from the middle 'twenties to the middle 'fifties, South Africa's agricultural terms of trade appear to have fluctuated without any indication of a consistent underlying tendency one way or the other. Thus it worsened from the middle 'twenties to the years around 1930, from 90.1 to 107.5, improved to 94.2 for the middle 'thirties, worsened again to 123.9 for the middle 'forties, and improved to 79.1 for the middle 'fifties. It may then have worsened slightly, but from 1958 there appears to have been, if anything, a tendency to improve slightly.

The relative agricultural terms of trade moved against agricultural exports from the middle 'twenties to around 1930, changing from 126 to 142; then in favour of agricultural exports to 109 for the middle 'thirties: against agricultural exports to 127 for the middle 'forties: and in favour to 94 for the middle 'fifties. After again having worsened somewhat towards 1960, the tendency since 1958 seems to have been rather in favour of agricultural exports, the index declining from about 112 to 103.3 in 1964.

The overall conclusion on the movement of South Africa's agricultural terms of trade over the past forty years must apparently be that it has most certainly not shown a tendency to worsen consistently, either seen by itself or relative to South Africa's overall terms of trade. It now remains to be seen what the combined effect of the observed movements in the physical volume and the prices of South Africa's agricultural exports has been on their relative value over the years.

VALUE MOVEMENTS

The combined effect of physical and price movements must be reflected in the movement of the value at current prices of agricultural exports. Fortunately, for this variable a fairly long, consistently defined series is available, viz. the Bureau of Statistics' tabulation of export values according to statistical classes for the period 1925 to 1963. This series can be supplemented with the I.S.I.C. tabulation, starting with 1957. In Table 3, the relevant series are presented, expressed as percentages of the total value of exports both excluding and including gold.

The relative movements of the values of agricultural and related exports, as shown in Table 3, conform broadly to what can be expected from the already observed physical and price movements. With minor interruptions, such as occurred around 1950 during the wool boom, exports of animal, agricultural and pastoral products tended to decline relatively from 52.4 per cent of total exports (excluding gold) around 1925, to 20.7 per cent around 1960 (from 25.1 to 12.4

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40) T.A. du Plessis, "The South African Economy", op. cit., p.155.

41) Morgan, op.cit., pp.11, 13, 16, 23, presented two series relating to South Africa and covering the period 1910 to 1952. Since both his series are based on domestic prices, which are of course distorted by import tariffs and price control, it is not surprising that there appears to be little similarity between the tendencies of his series and of those used here.

TABLE 2 - Changes in South Africa's agricultural terms of trade, averages for five-year periods 1925 to 1957, and annually 1958 to 1964

Five years with central year	Agricultural terms of trade[1]				Relative agricultural terms of trade[2]			
	Animals, agricultural and pastoral products, and foodstuffs[3]	Pastoral products, wattle, food and beverages[4]	Agriculture, forestry and fishing[5]	Food[6]	Animals, agricultural and pastoral products, and foodstuffs[3]	Pastoral products, wattle, food and beverages[4]	Agriculture, forestry and fishing[5]	Food[6]
	I	II	III	IV	V	VI	VII	VIII
	1947-49=100	1950=100[7]	1957=100		1947-49=100	1950=100	1957=100	
1925[8]	90.1	..	..	..	126	..	..	..
1930	107.5	..	..	..	142	..	..	..
1935	94.2	..	..	..	109	..	..	..
1940	115.2	..	..	..	122	..	..	..
1945	123.9	..	..	..	127	..	..	..
1950	80.8	79.2	..	..	91	91	..	..
1955	..	79.1	..	..	..	94	..	..
Year								
1958	..	92.2	122.0	106.4	..	98.4	112.2	97.9
1959	..	..	121.3	102.1	..	..	112.5	94.7
1960	..	..	124.1	108.9	..	..	111.4	97.8
1961	..	..	118.3	111.5	..	..	108.5	102.3
1962	..	..	119.5	107.7	..	..	107.3	96.7
1963	..	..	112.5	108.8	..	..	103.4	100.0
1964	..	..	108.8	110.0	..	..	103.3	104.5

Sources: Columns I and V based on Grové, op. cit., Tables 11 and 81, pp. 47, 183. Columns II and VI based on T. van Waasdijk, "Changes in South Africa's Terms of Trade 1950 - 1958", South African Journal of Economics 27(2): 116-24, June, 1959, pp.118, 121; Dr. van Waasdijk kindly provided the exact figures on which the graphs on p.121 had been based. Columns III, IV, VII and VIII based on Bureau of Statistics, Statistical Year Book 1966, p.Q-7.

1) Unit value index of all imports divided by unit value index of agricultural exports.
2) Agricultural terms of trade divided by terms of trade for all commodities, excluding gold.
3) Grové's Class I (Fisher formula).
4) Van Waasdijk's Wool, Food and Beverages, and Hides, Skins and Wattle indices combined by using weights obtained from Department of Customs and Excise, Annual Statement of Trade and Shipping, 1951, Table 7. (Laspeyres formula).
5) I.S.I.C. Section O.
6) I.S.I.C. Division 20.
7) Van Waasdijk's 1950 based series was linked to Grové's 1947-49 based series by equating Van Waasdijk's base year value to the corresponding Grové value and recalculating the rest of Van Waasdijk's figures according to the same ratio.
8) The three years 1925 to 1927 only.

per cent if gold is included in total exports). As appeared above, this was a period during which the physical volume of agricultural exports lagged behind that of total exports, while the relative agricultural terms of trade remained more or less constant.

The relative decline towards 1960 appears also if agricultural, forestry and fishing exports are expressed as a percentage of total exports, but since 1960, when the physical volume of agricultural exports started to catch up and the relative agricultural terms of trade may have started to improve slightly, the percentage increased from 22.4 to 32.2 in 1963, only to fall back to 28.6 in 1964, if gold is excluded from total exports (the corresponding percentages if gold is included are 13.4 in 1960, 18.4 in 1963, and 16.2 in 1964).

The general tendency is not significantly altered, although it appears to be rather less pronounced, if food, beverages and tobacco are added to the agricultural exports. With gold excluded, the percentage of agricultural and related products so defined first increased from 66.2 for

TABLE 3 - Relative changes in the value of South Africa's agricultural exports, averages for five-year periods 1924 to 1963, and annually 1957 to 1964

Five years with central year	Animal, agricultural and pastoral exports[1] as percentage of total exports		Agricultural and related exports[2] as percentage of total exports		Agriculture, forestry and fishing exports[3] as percentage of total exports		Agriculture, forestry and fishing and related exports[4] as percentage of total exports	
	Excluding gold	Including gold	Excluding gold	Including gold	Excluding gold	Including gold	Excluding gold	Including gold
	%	%	%	%	%	%	%	%
1925[5]	52.4	25.1	66.2	31.9	..	..	..	..
1930	45.3	18.3	69.2	27.2	..	..	..	..
1935	47.8	12.5	75.8	19.9	..	..	..	..
1940	39.1	9.1	65.4	15.2	..	..	..	..
1945	27.0	11.4	43.1	17.7	..	..	..	..
1950	33.2	20.1	49.3	33.5	..	..	..	..
1955	26.8	17.4	47.7	31.0	..	..	..	..
1960	20.7	12.4	45.2	27.1	..	..	..	..
Year								
1957	24.4	15.9	45.9	30.0	28.9	18.9	41.0	26.8
1958	20.5	12.7	45.4	28.1	24.9	15.4	40.5	25.1
1959	22.7	13.9	42.4	25.9	23.2	14.2	37.2	22.8
1960	20.4	12.2	41.6	24.9	22.4	13.4	37.0	22.2
1961	19.9	11.9	45.2	27.0	26.3	15.7	42.0	25.1
1962	20.0	11.5	51.6	29.8	30.4	17.6	46.5	26.8
1963	21.3	12.1	51.7	29.4	32.2	18.4	49.3	28.2
1964	..	..	..	..	28.6	16.2	45.7	25.9

Sources: Bureau of Census and Statistics, Union Statistics for Fifty Years, pp. K-4, N-4; Statistical Year Book 1966, pp.L-6, Q-11.

1) Bureau of Statistics, Statistical Class I (the use of these statistical classes was discontinued after 1963).

2) Bureau of Statistics, Statistical Classes I, II (Foodstuffs), III (Ales, spirits, wines and beverages), and IV (Tobacco).

3) I.S.I.C. Section O.

4) I.S.I.C. Section O plus divisions 20 (Food), 21 (Beverages), and 22 (Tobacco).

5) The four years 1924 to 1927 only.

the middle 'twenties to 75.8 for the middle 'thirties, after which it declined to 45.2 per cent around 1960, and on the I.S.I.C. basis again increased from 37.0 per cent in 1960 to 49.3 per cent in 1963.

The overall pattern suggested by the above analysis is that agricultural and related exports lagged behind total exports up to about 1960, after which it has caught up again to some extent. This conclusion is consistent with that of Swanepoel, who found that during the post-World War II years up to 1963, the value of primary agricultural exports increased at a rate of 5.2 per cent per annum as against 9.1 per cent per annum for all exports, excluding gold.[42]

42) C.J. Swanepoel, Veranderings in die Aanbod en Afset van Landbouprodukte gedurende die Na-oorlogse Tydperk van Algemene Ekonomiese Ontwikkeling in Suid-Afrika (M.Com. thesis, University of South Africa, Pretoria, 1967), p.187.

Two conclusions emerge from the above discussion, as seen against the perspective of the previous section. In the first place, since it has already appeared that total exports have long since ceased to be the leading growth factor in South Africa, and since agricultural exports have during most of the period under study lagged behind total exports, it is clear that agricultural exports do not fit Kindleberger's export-led growth model in the case of South Africa.

Secondly, the fact that the physical volume rather than the relative price movements of agricultural exports appear to have been responsible for the declining share of agricultural and related products in South Africa's total export value, suggests that the explanation must be sought in supply factors, rather than demand factors as postulated by Nurkse, Singer and Prebisch. This tentative conclusion gains some support from Groenewald's findings that the productivity of primary resources in South African agriculture showed no statistically significant increase immediately before and during World War II, but did

show a highly significant increase in the post-war period.[43]

Before going into the question whether South Africa's agricultural exports fit Kindleberger's export-balancing model, some brief remarks are in order on how agricultural exports measure up to the remaining two conditions for export-led growth.

SPILL-OVER EFFECTS AND SOCIO-ECONOMIC ASPECTS

It was stated earlier that exports can lead overall growth by inducing investment in infra-structure, and by exerting an intermediate demand for the output of other sectors. On the first point, it must be pointed out that the initial boom in infra-structure investment in the larger part of South Africa took place during the last quarter of the nineteenth century under the stimulus of diamond and gold mining, as evidenced by the fact that the open railway mileage in South Africa increased from some 160 miles in 1875, mainly in the Cape Colony, to some 4,167 miles around the turn of the century.[44] Over that whole quarter century, food, beverages and pastoral products, the main agricultural and related exports of the time, made up only 35 per cent of South Africa's total exports, and its share declined from 58 per cent for the years 1876-80 to 21 per cent for the years 1896-1900.[45] Since it has already been shown that during most of the twentieth century, while the infra-structure was further extended, agricultural and related exports seldom made up as much as one-third of South Africa's total exports, including gold, it must be clear that agricultural exports cannot have been an important cause of infra-structure development.

This leaves the backward linkage of agricultural exports to be considered. While, as contended earlier on, Hirschman's pessimistic conclusions about agricultural linkages are not necessarily valid as generalizations, it is relevant to point out in the first place that the value of agricultural exports is normally only some 35 per cent of the gross value of agricultural production.[46] Even if South African agriculture has exerted strong backward linkages agricultural exports can therefore take credit for only part of it. Furthermore, some of the most important agricultural exports, such as wool, mohair, hides and skins, which normally account for nearly 50 per cent of the value of all agricultural exports,[47] are produced under very extensive conditions and are on the face of it unlikely to exert strong backward linkages.

The remaining condition for export-led growth, viz. that socio-economic conditions in the export sector must be favourable to economic development, is difficult to evaluate. Suffice it to say that while South Africa's agricultural export sector does not fit Levin's "luxury importer" characterization closely, the generation of income in that sector has by all indications not given rise to savings that were invested on a significant scale in non-agricultural sectors, as has happened in the case of, e.g., Japan.[48]

Since agricultural exports do not appear to meet any of the three necessary conditions to qualify as a leading growth sector, it remains to evaluate their role as a balancing sector.

AGRICULTURAL EXPORTS AS BALANCING SECTOR

It has already been pointed out in Section II that primary exports can be regarded as having played, in Kindleberger's terminology, a balancing role in South Africa's economic development. Table 4, based upon J.C. du Plessis' data as supplemented by Swanepoel, provides the information required to assess the contribution of agricultural exports in this respect.

While the overwhelming importance of mining - principally gold mining - as a positive net contributor to the current account is clearly evident from J.C. du Plessis' figures,[49] it is also apparent that agriculture, forestry and fishing are responsible for a significant supplementary contribution. Their surplus of foreign exchange

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43) J.A. Groenewald, "Changes in primary Resources in the South African Agriculture", Agrekon 3(3): 21-8, July 1964, pp.26-8.

44) Cf. S.H. Frankel, Capital Investment in Africa: Its Course and Effects (London and New York: Oxford University Press, 1938), pp. 56-7. Also C.G.W. Schumann, Structural Changes and Business Cycles in South Africa, 1806-1936 (London and New York: Staples Press, 1938), pp. 53-5. Schumann ascribes the construction of the first 63 miles of railways only to the influence of agriculture, and of the next 3,175 miles up to 1895 to diamond and gold mining. From 1896 to 1909 he names agricultural and industrial interests as the main influences behind branch extensions - but even then, mining revenues presumably provided much of the financing of the branchline extensions.

45) Schumann, op. cit., pp.44, 46-7.

46) Cf. Agrekon 6(3), July 1967, Tables 3 and 4, pp.24-5.

47) Loc.cit.

48) B.F. Johnston, "Agricultural Productivity and Economic Development in Japan", Journal of Political Economy 59(4): Dec. 1951.

49) J.C. du Plessis, op. cit., p.315.

TABLE 4 - Absolute and relative net contribution of agriculture, forestry and fishing to the current account of South Africa's balance of payments, 1948 to 1964

Year	Total positive net contributions[1]	Net contribution of agriculture, forestry and fishing		Total negative net contributions	Total
		Absolute value	Percentage of total		
	R million	R million	%	R million	R million
1948	..	41	..	..	..
1949	..	60	..	..	..
1950	..	80	..	..	..
1951	..	108	..	..	..
1952	..	142	..	..	..
1953	..	133	..	..	..
1954	..	133	..	..	..
1955	..	152	..	..	..
1956	669	161	24.1	-669	0
1957	738	178	24.1	-749	-11
1958	655	129	19.7	-808	-153
1959	779	144	18.5	-613	166
1960	781	129	16.5	-760	21
1961	888	182	20.5	-685	203
1962	982	222	22.6	-674	308
1963	1,053	237	22.5	-905	148
1964	1,115	249	22.3	-1,171	-56

Sources: For 1948 to 1955, Swanepoel, op. cit., p.254; for 1956 to 1964, J.C. du Plessis, op. cit., pp. 329-30.

1) In addition to agriculture, forestry and fishing, contributions here are mainly from mining, which in turn means mainly gold mining.

earnings over foreign exchange use for productive purposes increased, with some interruptions: from an average of R60 million for the three years 1948 to 1950, to an average of R236 million for the three years 1962 to 1964, and since 1956 their relative contribution to total positive net contributions to the current account has been all but maintained at a little over 20 per cent. Together with gold mining and to some extent other mining, agricultural exports have undoubtedly performed a valuable balancing or supporting function in the post-World War II transformation of the South African economy. There is no reason to suspect that this role had been less significant in earlier years.

IV. The above analysis has led to the conclusion that agricultural exports, in common with other exports, cannot be regarded as having provided the principal impetus to South Africa's economic development during the past four decades or so. During this period, domestic factors have come to dominate the development of the South African economy, and the key among these domestic factors has been industrialization based on import substitution and the growth of domestic final demand. But while exports, including agricultural exports, could not lead the process of change, they have nevertheless performed an essential permissive function by obviating foreign exchange constraints which in their absence may well have inhibited development. If agricultural exports cannot claim to have been South Africa's "engine of growth" during the twentieth century, at least they have helped to provide the lubrication without which the engine may have ground to a halt.